IS 8357 (1977): Method for assessment of fabric drape [TXD 1: Physical Methods of Tests]

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Indian Standard

METHOD FOR
ASSESSMENT OF FABRIC DRAPE

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METHOD FOR
ASSESSMENT OF FABRIC DRAPE

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Indian Standard

METHOD FOR
ASSESSMENT OF FABRIC DRAPE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 14 February 1977, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 Drape is one of the subjective performance characteristics of fabric that contributes to aesthetic appeal; it is a complex property involving bending and shearing deformations. The present standard provides a simple method for the objective estimation of the extent to which a fabric drapes; draping quality is expressed as drape coefficient which theoretically varies between 0 and 100.

0.3 Drape measurements can be employed for study of the effects of fabric geometry, chemical processing treatments and finishes for woven and knitted fabrics, certain qualities of non-wovens like leather for apparel. Drape coefficient can also be used as an index for control of batches in production.

0.4 In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS:2-1960*.

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1. SCOPE

1.1 This standard prescribes a method of test for the assessment of drape of fabrics and is applicable to all fabrics intended for end uses in which drape is important.

2. PRINCIPLE

2.1 A circular fabric specimen is sandwiched between two horizontal discs of smaller diameter, and the unsupported annular ring of fabric is allowed to hang down under the action of gravity. A planar projection of the contour of the draped specimen is recorded on a light-sensitive paper. The drape pattern obtained is cut along the outline and its area determined gravimetrically. The drape coefficient is calculated as the ratio of the projected area of the drape specimen to its theoretical maximum.

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*Rules for rounding off numerical values (*revised*).

3. TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Fabric Drape — The extent to which a fabric will deform when it is allowed to hang under its own weight.

3.2 Drape Co-efficient — The area covered by the shadow of the draped specimen expressed as a percentage of the area of the annular ring of fabric.

4. APPARATUS

4.1 Drape Tester — Consisting of:

a) a pair of horizontal discs of 12.3 cm diameter between which the specimen is held; the lower disc has a central pin for positioning on a holder.

b) an actinic source of light placed directly above the centre of the discs with suitable attachment to give a parallel beam of light.

c) arrangement to place a sheet of ammonia process paper horizontally below the draped specimen (*see also* **4.3**).

d) timer and other devices to aid exposure for prescribed time.

e) an enclosed box for developing the drape pattern in ammonia vapour.

NOTE — An outline of a suitable apparatus developed by Bombay Textile Research Association, Bombay working on the above principles is given in Appendix A*.

4.2 Circular Template — A metal template of 250 mm diameter and with a central hole for marking and cutting specimens for drape test.

4.3 Ammonia Process Paper

NOTE 1 — In case ammonia process paper is not available, a good quality drawing paper may be used, and the outline of the drape pattern may be carefully traced by hand.

NOTE 2 — For better results photographic grade of ammonia paper may be used.

4.4 Balance — Capable of determining mass to the accuracy of 0.01 g.

5. ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

5.1 The test specimens shall be conditioned to moisture equilibrium in standard atmosphere of 65 ± 2 percent RH and $27\pm2°C$ before testing (*see* IS:6359-1971†) and the tests shall be carried out in the standard atmosphere.

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*Mention of the name of a specific (or proprietory) instrument is not intended to promote or give preference to the use of that instrument over those not mentioned.

†Method for conditioning of textiles.

6. PREPARATION OF TEST SPECIMENS

6.1 Marking and Cutting — Place the fabric free from creases and wrinkles on a flat horizontal surface and by means of the template (**4.2**) trace the outline, mark the centre of each, and cut the specimens. Ensure that the specimens represent adequately the fabric under test and exclude the areas within 5 cm of the selvedges and those with wrinkles or sharp folds.

7. PROCEDURE

7.1 Place the drape tester firmly on a level table. Switch on the light. (The mercury vapour lamp when lighted attains full brightness after a few minutes.)

7.2 Remove the specimen holder from the bayonet socket and place a cut fabric specimen between the plates. Hold the stub of the specimen holder assembly and briskly move the holder with the specimen up and down ten times, each time resting on the table for a moment. (This is to allow the fabric to orient itself freely and drape into natural folds.)

7.3 Place a square of ammonia process paper on the base of the instrument and lay it flat.

7.4 Insert the stub of the specimen holder (with the specimen) in the socket on the threaded bolt. Press upwards and turn counter clock-wise to lock the holder in position.

7.5 Looking along the level of the base-board, adjust the height of the drooping edge of the drape specimen, so that the lowermost edge is just above the paper without touching it.

7.6 Adjust the setting knob of the timer for the required time of exposure.

> Note — The optimum exposure time depends on the quality of the paper used, and will have to be determined experimentally.

7.7 At the end of the exposure time, remove the ammonia process paper and place the same in the developing box containing a few millilitres of strong ammonia solution. Remove the paper when the latent is developed.

7.8 Condition the paper to moisture equilibrium in standard atmosphere. Cut out the drape pattern with a pair of scissors and determine its mass in gram correct to two decimal places.

7.9 Determine the mass per unit area of the paper used by cutting a known area of the original paper and weighing.

7.10 Reverse the specimen and obtain the drape pattern with the other surface upwards.

7.11 Number of Tests — Test at least four specimens making a total of eight measurements.

8. CALCULATIONS

8.1 Calculate the drape co-efficient for each test as under:

$$\text{Drape co-efficient } (F\%) = \frac{\dfrac{w}{W} - a}{A - a} \times 100$$

where

W = mass per unit area of the paper,

w = mass of the drape pattern,

a = area of circle of 12·5 cm diameter = 122·8 cm², and

A = Area of circle of 25 cm diameter = 491·1 cm².

<div align="center">OR</div>

By substituting the values of 'a' and 'A':

$$\text{Drape co-efficient} = \frac{\dfrac{w}{W} - 122\cdot8}{368\cdot3} \times 100$$

8.2 Calculate the arithmetic mean of all the individual test values and round it off to two significant figures.

9. REPORT

9.0 The report shall comprise the following information:

a) Type of fabric;

b) Name of the instrument used;

c) Number of specimens tested; and

d) Mean drape co-efficient.
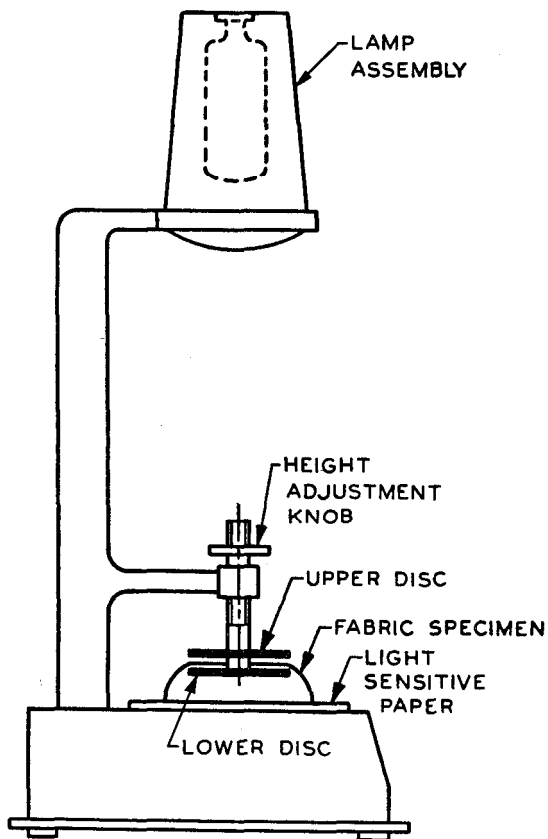
APPENDIX A

[*Clause* 4.1 (*Note*)]

FIG. 1 ESSENTIAL FEATURES OF DRAPE TESTER*

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*A suitable instrument is available with the Bombay Textile Research Association, Lal Bahadur Shastri Marg, Ghatkopar (West), Bombay 400086.

INDIAN STANDARDS

ON

PHYSICAL METHODS OF TEST

IS:

232-1967	Glossary of textile terms — natural fibres (*first revision*)
234-1973	Methods for determination of linear density of textile fibres (gravimetric method) (*first revision*)
570-1964	Methods for determination of universal count of jute yarn (*revised*)
1670-1970	Method for determination of breaking load, elongation at break and tenacity of yarns (*first revision*)
1671-1960	Method for determination of skein breaking load (strength), tenacity and yarn strength index of cotton yarn (by constant-rate-of-traverse machine) (metric system)
1954-1969	Methods for determination of length and width of fabrics (*first revision*)
1963-1969	Methods for determination of threads per decimetre in woven fabrics (*first revision*)
1964-1970	Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*)
1966-1975	Methods for determination of bursting strength and bursting distension of fabrics: diaphragm method (*first revision*)
1969-1968	Methods for determination of breaking load and elongation at break of woven textile fabrics (*first revision*)
2364-1963	Glossary of textile terms — fabrics made from natural fibres
2387-1969	Methods for determination of weight of jute fabrics (*first revision*)
2702-1965	Method for determination of thermal resistance of textile fabrics, guarded hot-plate method
4125-1967	Glossary of terms pertaining to defects in fabrics
4681-1968	Methods for determination of wrinkle recovery of fabrics (by measuring crease recovery angle)
6359-1971	Method for conditioning of textiles
6489-1971	Methods for determination of tear strength of woven textile fabrics by Elmendorf tester
6490-1971	Method for determination of stiffness of fabrics — cantilever test
6668-1972	Method for preparing test specimens from fabric samples for physical tests
7702-1975	Thickness of woven and knitted fabrics